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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NORMAN C. FAWLEY

Appeal 2010-006654
Application 10/695,252
Technology Center 1700

Before CHARLES F. WARREN, TERRY J. OWENS, and
LINDA M. GAUDETTE, *Administrative Patent Judges*.

GAUDETTE, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision¹ finally rejecting claims 1, 4, 6-10, 17, and 18.² We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Claim 1, the sole independent claim, and dependent claim 17 are representative of the invention and are reproduced below from the Claims Appendix to the Appeal Brief:

1. A method of bending Composite Reinforced Pipe (CRP) comprising:

placing a heater proximate to a a [sic] plurality of longitudinally displaced locations along the pipe where the pipe is to be bent, the pipe having a composite reinforcement comprising a resin and reinforcement fibers coupled thereto;

heating the pipe to a temperature above a heat distortion temperature of the resin such that the composite reinforcement is heated to a temperature below a heat distortion temperature of the composite reinforcement; and

bending the pipe incrementally at the plurality of longitudinally displaced locations, the longitudinally displaced locations separated by a distance equal to approximately ¼ of a diameter of the pipe.

17. The method of claim 1 wherein the reinforcement fibers are positioned circumferentially and longitudinally along the pipe.

Appellant requests review of the following grounds of rejection (App. Br.):

¹ Final Office Action mailed Mar. 31, 2009 ("Final").

² Appeal Brief filed Sep. 8, 2009 ("App. Br.").

1. claims 1, 4, 6-10, 17, and 18 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement (Ans.³ 4-5);
2. claims 1, 4, 6, 7, and 9 under 35 U.S.C. §103 as unpatentable over Smith (US 2004/0060497 A1, published Apr. 1, 2004) in view of Clavin (US 4,132,104, issued Jan. 2, 1979) and Lewis (EP 1086760 A2, published Mar. 28, 2001) as evidenced by Drobny (*Handbook of Thermosplastic Elastomers*, 2007, William Andrew Publishing, 137-138) (Ans. 5-8);
3. claims 8 and 10 under 35 U.S.C. §103 as unpatentable over Smith in view of Clavin and Lewis as evidenced by Drobny as applied to claim 1, and further in view of Miller (US 4,255,378, issued Mar. 10, 1981) (Ans. 8-9); and
4. claims 17 and 18 under 35 U.S.C. §103 as unpatentable over Smith in view of Clavin and Lewis as evidenced by Drobny, and further in view of Wolfe (US 5,435,867, issued Jul. 25, 1995) (Ans. 9-10).

*Rejection of claims 1, 4, 6-10, 17, and 18 under
35 U.S.C. §112, first paragraph, written description requirement*

The Examiner contends the claim 1 limitation of “placing a heater proximate to a plurality of longitudinally displaced locations” is not supported by the originally filed Specification because “[c]laim 1 includes having multiple heaters, which is not disclosed in the Specification as originally filed.” (Ans. 4-5.) For the reasons explained on page 7 of the Appeal Brief (second full paragraph), we are in agreement with Appellant that “[t]he ordinary plain meaning [sic, meaning] of ‘a heater,’” as used in the context of claim 1, “would be understood by a person of ordinary skill in the art is [sic, as] a *single* heater and not a plurality of heaters as

³ Examiner’s Answer mailed Dec. 9, 2009.

argued by the Examiner.” The originally filed Specification clearly supports the use of a single heater (*see Spec. [0012]* (“induction heater 30”).)

Accordingly, we do not sustain this ground of rejection.

Rejection of claims 1, 4, 6-10, 17, and 18 under 35 U.S.C. §103(a)

Appellant presents arguments in support of separate patentability of claim 17. (App. Br. 12-13.) Claim 18 depends from claim 17 and, therefore, stands or falls with claim 17. (*See id.* at 13.) The remaining dependent claims, i.e., claims 4, and 6-10, stand or fall with independent claim 1. (*See id.* at 10-11.)

Claim 1

The issue we consider with respect to claim 1 is whether the Examiner relied on impermissible hindsight reasoning in determining it would have been obvious at the time of the invention to modify Smith’s pipe bending method by forming the bends at increments equal to $\frac{1}{4}$ of the pipe diameter, as required by the bending step of claim 1.

Appellant does not dispute the Examiner’s findings with respect to the teachings of Smith. (*See App. Br. 9-10; compare App. Br. 4-5 with Ans. 5-7* (discussing Smith’s disclosure).) As found by the Examiner (Ans. 6), Clavin discloses it was known in the art at the time of the invention to form a bend of less than one degree per arc foot (col. 5, ll. 3-5) in twelve inch diameter coated pipe (col. 2, ll. 51-53). Appellant concedes that this is a teaching of bending a pipe 1° , at increments equal to the diameter of the pipe. (App. Br. 9.)

Appellant does not dispute the Examiner’s determination that it would have been obvious to have modified Smith’s process based on the teachings of Clavin (Ans. 6), and that the combined teachings of Smith, Clavin and Drobny⁴ disclose

⁴ Drobny is relied on to establish the use of induction heating would result in Appellant’s claimed heating step. (*See Ans. 7.*)

the invention as claimed in claim 1 with the exception of an explicit teaching of bending at increments equal to $\frac{1}{4}$ the length of the pipe's diameter (Ans. 7). (See App. Br. 9-10.)

Appellant does not disagree with the Examiner's finding that Lewis teaches a desired overall arc can be achieved through incremental $\frac{1}{4}^\circ$ bends. (See *id.* at 5 and 9-10.)

The Examiner determined “[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Lewis' bend increments [of $\frac{1}{4}^\circ$] with Smith's pipe bending because Lewis teaches that $\frac{1}{4}^\circ$ bends can incrementally achieve the larger overall arc desired to be obtained.” (Ans. 7 (citations omitted).) The Examiner's proposed motivation to modify the process of Smith in view of Clavin is supported by Lewis's disclosure that “[b]y making each incremental bend uniform, . . . highly accurate overall bends can be accomplished. This . . . reduces the number of pipes that may be damaged, over bent or otherwise rendered unusable.” (Lewis col. 12, ll. 11-16.)

Appellant does not dispute that if Lewis' $\frac{1}{4}^\circ$ incremental bending process were used in Smith's method to achieve Clavin's desired overall bend of less than 1° per arc foot in twelve inch diameter pipe, the bends would be longitudinally displaced by a distance equal to approximately $\frac{1}{4}$ of the pipe diameter as required by appealed claim 1 (Ans. 7). (See App. Br. 9-10.)

Appellant's sole argument is that the Examiner's obviousness determination is based on impermissible hindsight reasoning “because there is no teaching or suggestion *in either Clavin or Lewis* to separate bends by [increments equal to $\frac{1}{4}$ of the pipe diameter].” (App. Br. 10 (emphasis added).)

Like the Examiner (*see* Ans. 11-12), we find Appellant's argument unpersuasive because it is directed to the references individually, and does not

address the Examiner’s proposed motivation to modify Smith, which is based on the combined teachings of Clavin and Lewis. In our view, the Examiner’s fact finding and reasoning is sufficient to establish that one of ordinary skill in the art would have been motivated to combine the references in the manner claimed. As indicated above, Appellant has not disputed that the references, if properly combined, would result in the method recited in appealed claim 1. Accordingly, we affirm the rejections of claims 1, 4, and 6-10 under 35 U.S.C. §103(a).

Claim 17

The issue we consider with respect to claim 17 is whether the Examiner reversibly erred in determining it would have been obvious, based on the teachings of Wolfe, to have positioned the fibers of Smith’s composite reinforcement circumferentially and longitudinally along the pipe, because Wolfe teaches away from using such configuration in a non-static pipe.

Wolfe teaches it was known in the art to use “a variety of continuous fibre reinforcement patterns to achieve the required effective laminate properties” for composite tubular structures. (Wolfe col. 2, ll. 50-62.) One such pattern combined “longitudinal-oriented reinforcing fibres (parallel to the cylinder axis) to resist axial loads together with circumferential oriented reinforcing fibres (perpendicular to the cylinder axis) to resist hoop loads.” (Wolfe col. 2, l. 65-col. 3, l. 2.) Appellant relies on the following paragraph in Wolfe to establish “that this positioning of fibers should not be used when the pipe will be flexed or bent” (Rep. Br.⁵ 9 (citing Wolfe col. 3, ll. 15-20)):

Where the structure is intended to be relatively rigid and is not required to exhibit significant flexibility, the laminate may employ appropriate patterns to meet the anticipated loading conditions.

⁵ Reply Brief filed Feb. 9, 2010.

However, where a flexible structure is required, additional considerations apply.

“A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). *See also*, *Syntex (U.S.A.) LLC v. Apotex, Inc.*, 407 F.3d 1371, 1380 (Fed. Cir. 2005) (“A statement that a particular combination is not a preferred embodiment does not teach away absent clear discouragement of that combination.”).

The Examiner acknowledges that Wolfe teaches there can be inconsistencies in strength in composite tubular structures which use Appellant’s claimed fiber pattern. (Ans. 12-13 (citing Wolfe col. 3, l. 56-col. 4, l. 16).) However, like the Examiner, we do not view Wolfe’s disclosure as teaching away from using this particular arrangement. The above-quoted paragraph from Wolfe applies to composite tubular structures requiring “significant flexibility.” Appellant has not shown that significant flexibility is needed to effect the type of bends required in Smith’s large diameter pipes. Moreover, we are in agreement with the Examiner that the ordinary artisan could readily view the advantages achieved by using a fiber orientation as claimed as outweighing any adverse effect on flexibility. (*See Ans. 13.*)

Accordingly, because we are not persuaded the Examiner reversibly erred in determining it would have been obvious, based on the teachings of Wolfe, to have positioned the fibers of Smith’s composite reinforcement circumferentially and longitudinally along the pipe, we affirm the rejections of claims 17 and 18 under 35 U.S.C. §103(a).

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In sum, we reverse the rejection of claims 1, 4, 6-10, 17, and 18 under 35 U.S.C. §112, first paragraph, but affirm the rejections of these claims under 35 U.S.C. §103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1).

AFFIRMED

kmm